Amendments to the Claims:

The following claims will replace all prior versions of the claims in this application (in the unlikely event that no claims follow herein, the previously pending claims will remain):

1-49. (Cancelled).

50. (New) Method of producing a chemically surface modified nanoporous silica gel with a high ligand loading selectable, by controlling the degree of reaction and/or the starting concentration for the ligand-introducing reactant, up to about 7.5 mmole per gram of silica gel and open channel pore structure connecting at least nanopores by either a direct one-pot reaction in which surface modification takes places in the same reactor as wet gel-formation or by a two-step reaction in which surface modification takes place separately following wet gel-formation while the gel is still in the wet state, comprising:

(a) forming wet silica gel structure having a plurality of open channels and silanol (Si-OH) groups on the surface thereof, by gelling a silica gel precursor in the presence of an aqueous-alcohol solvent for a temperature and time which will not promote crosslinking condensation, thereby preventing crosslinking condensation prior to reaction of the silanol groups with a ligand-carrying silane coupling reagent, said gelling taking place, optionally, in the presence of a liquid which is insoluble in said solvent and an amount of surfactant for minimizing the interfacial energy between the insoluble phases but less than the amount required for forming micelles;

(b) reacting the plurality of surface silanol groups on the wet silica gel with the silanol groups of a hydrolyzed silane coupling agent, in a mixed aqueous-alcohol solvent medium, which may be the same as the aqueous-alcohol solvent in step (a), under an inert atmosphere and at an elevated temperature within the range of from 40° C to 80° C, to cause condensation and reaction with up to substantially all of the plurality of surface silanol

groups, to thereby form said chemically surface modified silica gel with high ligand loading and open channel pore structure; and, optionally,

(c) drying the chemically surface modified silica gel having the high ligand loading and the open channel pore structure with minimizing the formation of crosslinking of the surface silanol groups.

51. (New) Method according to claim 50, which is carried out as a one-pot reaction, wherein in step (a) the hydrolyzed silane coupling reagent functions as a surfactant and alcohol functions as a co-solvent to assure ligand compatibility with silica sol and the reaction of step (b) occurs following gelation in the same reactor, and drying the resulting chemically surface modified silica gel to thereby obtain said high-ligand loaded chemically surface modified silica gel.

52. (New) Method according to claim 51, which further comprises adjusting the pH to induce gelation.

53. (New) Method according to claim 50, which is carried out as a two-step reaction, wherein step (a) comprises maintaining a freshly prepared silica gel at a temperature in the range of from 40 °C to 80 °C in a moist state for about 30 to 60 minutes to obtain a wet nanoporous silica gel, and step (b) comprises introducing a silane coupling agent and cosolvent to the freshly prepared silica gel, and reacting under said inert atmosphere and at said elevated temperature to form said surface modified silica gel.

54. (New) Method according to claim 50, wherein the alcohol is ethanol.

55. (New) Method according to claim 50, wherein the amount of the hydrolyzed silane coupling agent is selected to achieve a high ligand loading level of about 7.5 mmole per gram of silica gel.

56. (New) Method according to claim 51, wherein the hydrolyzed silane coupling agent is (a) 3-mercapto-(mono- or di)-alkyl(di- or tri-) alkoxy silane, (b) 3-aminopropyltriethoxysilane ethylenediamine mono-, di-, tri- or tetra-acetate, the dithiocarbamate derivatives thereof, (c) N-[3-(trimethoxysilyl)propyl]ethylenediamine, and the triacetic acid trisodium salt thereof, (d) chitin and derivatives thereof, or (e) 1-nitroso-2-naphthol, 5-sulfodimethylisophthalate salts.

57. (New) Method according to claim 50, wherein the ligand group or ligand introducing compound has a first functional group at one end thereof reactive with the silanol groups of silica and a second functional group at an opposed end thereof, said second functional group strongly binding to a target specie for adsorbing the target specie from a liquid containing said target specie suspended or dissolved therein, as determined by at least one of bond energy between the second functional group and target specie or solubility product constant, Ksp.